

The opinion in support of the decision being entered today was not written for publication and is not binding precedent of the Board.

Paper No. 24

UNITED STATES PATENT AND TRADEMARK OFFICE

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BEFORE THE BOARD OF PATENT APPEALS  
AND INTERFERENCES

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*Ex parte* KIRK D. PRALL

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Appeal No. 2003-1556  
Application 09/288,932

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ON BRIEF

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Before OWENS, WALTZ and KRATZ, *Administrative Patent Judges*.  
OWENS, *Administrative Patent Judge*.

*DECISION ON APPEAL*

This appeal is from the final rejection of claims 1-12, which are all of the claims remaining in the application.

*THE INVENTION*

The appellant claims a semiconductor structure which has a specified removable spacer layer and is useful for forming a

semiconductor device having a sublithographic buried contact.

Claim 1 is illustrative:

1. A semiconductor structure for formation of a semiconductor device having a sublithographic buried contact therein, the assembly comprising:

a plurality of transistor gate structures and word lines adjacent a buried contact area on a substrate, the word lines lying in substantially parallel relation to one another and defining a first gap between word lines peripheral to the buried contact and a second gap between word lines atop the buried contact, which second gap is wider than the first gap;

an insulator layer deposited over and adjacent the gate structures, word lines, buried contact area, and substrate; and

a removable spacer layer deposited over the insulator layer substantially filling the first gap, partially filling the second gap, and defining a sublithographic dimension between removable spacer walls formed over the buried contact area, the removable spacer walls being formed by the removable spacer layer adjacent the plurality of gate structures, wherein the removable spacer layer provides an enhanced etching selectivity in relation to the insulator layer and is adapted to be completely removed when isotropically etched.

#### *THE REFERENCES*

Cathey et al. (Cathey)	5,069,747	Dec. 3, 1991
Kobayashi	5,422,315	Jun. 6, 1995

#### *THE REJECTION*

Claims 1-12 stand rejected under 35 U.S.C. § 103 as being unpatentable over Kobayashi in view of Cathey.

OPINION

We reverse the aforementioned rejection. We need to address only the independent claims, i.e., claims 1 and 6.

The appellant's claims 1 and 6 both require a removable spacer layer which is over an insulator layer, has an enhanced etching selectivity in relation to the insulator layer, and is adapted to be completely removed when isotropically etched.

The examiner argues, in reliance upon *In re Hutchinson*, 154 F.2d 135, 69 USPQ 138 (CCPA 1946), that "adapted to" does not constitute a limitation in any patentable sense (answer, page 7). In *Hutchinson* the court did not consider the preamble phrase "adapted for use in the fabrication of a metal template or the like" to "constitute a limitation in any patentable sense". See *Hutchinson*, 154 F.2d at 138, 69 USPQ at 141. In the present case, in contrast, "adapted to" imposes a capability requirement on the removable spacer, i.e., it must be completely removable when isotropically etched.

The examiner argues that the appellant's "isotropically etched" limitation is a method limitation in a product-by-process claim and, therefore, is given no patentable weight in determining the patentability of the final device structure (answer, pages 4-5 and 7). The appellant's semiconductor

structure as claimed, however, includes a removable spacer layer which is "adapted to be completely removed when isotropically etched." Hence, the ability of the removable spacer layer to be completely removed when isotropically etched is a capability requirement of part of the claimed semiconductor structure.

The examiner considers Kobayashi's second insulator layer (26) to correspond to the appellant's removable spacer layer (answer, pages 3-4). The examiner argues that one of ordinary skill in the art would have been led to replace Kobayashi's second insulator layer with Cathey's removable spacer layer (21) (col. 4, line 63 - col. 5, line 2; col. 5, lines 9-13) so that the layer could be removed without significantly etching the first insulator layer (24) and enlarging the size of a buried contact opening between adjacent word lines (answer, page 4).

Kobayashi, however, does not indicate that any of the first insulator layer is removed when the desired portion of the second insulator layer is etched away. In fact, Kobayashi shows that after the second insulator layer has been etched, the first insulator layer remains almost completely covered by the second insulator layer (figure 2D). Moreover, Kobayashi leaves a portion of the second insulator layer in place to surround or confine the contact hole (col. 4, lines 5-14; figure 2G). For

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these reasons, Kobayashi would not have indicated to one of ordinary skill in the art that the contact hole is enlarged due to removal of the first insulator layer.

The examiner, therefore, has not established that the applied references would have led one of ordinary skill in the art to replace Kobayashi's second insulator layer with Cathey's removable spacer layer. Accordingly, we reverse the examiner's rejection.

*DECISION*

The rejection of claims 1-12 under 35 U.S.C. § 103 over Kobayashi in view of Cathey is reversed.

*REVERSED*

	)	
TERRY J. OWENS	)	
Administrative Patent Judge	)	
	)	
	)	
	)	BOARD OF PATENT
THOMAS A. WALTZ	)	
Administrative Patent Judge	)	APPEALS AND
	)	
	)	INTERFERENCES
	)	
PETER F. KRATZ	)	
Administrative Patent Judge	)	

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